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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,379	10/22/2003	Lambert Haner	28870US1	8665
116	7590	03/16/2004	EXAMINER	
PEARNE & GORDON LLP 1801 EAST 9TH STREET SUITE 1200 CLEVELAND, OH 44114-3108			JONES, JUDSON	
			ART UNIT	PAPER NUMBER
			2834	

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/691,379

Applicant(s)

HANER, LAMBERT

Examiner

Judson H. Jones

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4 is/are allowed.
- 6) ☒ Claim(s) 5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

The subject matter of claim 5 admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81. No new matter may be introduced in the required drawing. Figures 8A-8D shows waveforms for the pulse width embodiment of applicant's invention. Drawing figures are needed to illustrate the waveforms for the pulse amplitude embodiment of applicant's invention, to show how the speed of the motor changes corresponding to the pulse amplitude of the signals. Also waveforms are shown in figure 7 at the outputs or inputs of some circuit elements. Adding some waveforms to figure 13 would make the invention easier to understand.

### ***Claim Interpretation***

In regard to the phrase "the signals varying in amplitude in a cyclic manner corresponding to the speed of rotation of the rotor of the motor," this is interpreted to mean that the signals vary in amplitude corresponding to the speed of rotation and also that the signals vary in a cyclic manner corresponding to the speed of rotation. (Therefore the speed of rotation of the motor has to vary in a cyclic manner.)

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the

specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claim includes a phrase, “the signals varying in amplitude in a cyclic manner corresponding to the speed of rotation of the rotor of the motor”. Page 18 lines 23-27 of the specification states “The rotor 14 rotates synchronously at the speed that the field vector 81 is rotated. As discussed below, the field windings can be supplied with modulated AC currents from power amplifiers operated by a signal processor to appropriately rotate the magnetic field vector 81.” Lines 16 and 17 of page 18 show an equation relating the amplitude of the currents  $I_x$  and  $I_y$  with the angular position  $\theta$  of the field vector 81. Following that section the specification goes on to discuss how changes in vector angle  $\theta$  change the torque output of the motor at the bottom of page 18 and the top of page 19. Page 19 lines 9-10 state, “This torque varies with the magnitude of angle  $\Psi$ .” Page 19 lines 12 and 13 state, “Note the relationship  $\Psi = \theta - \Phi$ .” Page 19 lines 14-16 state, “As previously discussed, the vector angle  $\theta$  is varied by varying the current amplitude in the field windings X, Y.” In page 19 lines 19 and 20 the current magnitudes  $I_x$  and  $I_y$  are shown in a formula also containing  $\omega_r$  (the rotational speed of the motor) but it is not clear that a change in  $\omega_r$  produces a corresponding change in  $I_x$  and  $I_y$  or vice versa. According to page 20 lines 19-27, “The signal processor 86 in accordance with the foregoing formulas generates the currents  $I_x$ ,  $I_y$  as functions of the frequency  $F_c$ , rotor position  $\theta$  (which indicates rotor speed  $\omega_r$ ), and torque command deflection angle  $\Psi$  to control the torque characteristics of the motor 80. The speed of the motor is controlled according to the rate  $\omega$  at which the carrier signal is modulated, which can be selected by a speed input.” Here the speed of rotation of the motor is shown as being related to a speed input signal (see speed adjustment potentiometer 72 in applicant’s figure 11). Figure 13 shows a

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rotor position signal going into speed or position feedback element 88 which sends a signal to torque control element 84 which sends a signal to signal processor 86. This seems to indicate that one signal is used to change both the torque and the speed of the motor.

What the specification appears to show is signals varying in amplitude corresponding to the torque of the motor and/or the speed of rotation of the rotor of the motor. As for the signals varying cyclically, if the motor is subjected to a load, then the amplitude of the signals will respond to the load and vary according to the load of the motor. That variation will not be cyclic. What applicant appears to show is signals that vary in amplitude corresponding partially or corresponding part of the time to the speed of rotation of the rotor of the motor.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. 6,078,161 B1 in view of Notohara et al. 6,626,002 B1. Kim et al. 6,078,161 A shows a plurality of switches to generate power signals and teaches in column 1 lines 11-21 "compensating a current value corresponding to the compared current error." This teaches varying the signal, with the signal variation being cyclic because each time the rotor rotates, it sees the same poles with the same strength at any given position of the rotor. Thus the rotor will produce the same current compensation signals during each cycle of rotation. Kim et al. states in column 4 lines 23-30, "the current which is actually applied can be compensated ... by performing a pulse width

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modulation after receiving the current controlling signal. Column 6 line 14 to column 8 line 54 in combination with figures 8A-8G explain the operation of the Kim et al. device. Kim et al. figure 8F clearly shows pulse width modulated signals, not pulse amplitude modulated signals.

Notohara et al. teaches using both PWM control and PAM control, switching between the different modes depending on which one operates most efficiently at a given motor speed. Since Notohara et al. and Kim et al. are from the same field of endeavor it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized pulse amplitude modulation in cases where pulse amplitude modulation was more efficient than pulse width modulation.

***Allowable Subject Matter***

Claims 1-4 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not disclose or teach an electric motor with field windings on the stator for producing an AC magnetic field with a vector at successive angular positions around the axis of rotation when the windings are successively energized with single phase AC power as recited in claim 1.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Judson H. Jones whose telephone number is 571-272-2025. The examiner can normally be reached on 8-4:30 M-F.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JHJ 3/5/2004



**THANH LAM**  
**PRIMARY EXAMINER**